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### Electricity in the Iraqi Reconstruction

Ever since Baghdad was liberated by Coalition Forces in early April, one of the most high-profile topics in the post-war reconstruction has been the restoration of Iraq's power supply. USAID has been deeply involved in this effort. This special edition of the USAID Daily Update provides an overview of USAID's activities in the power sector, our initial goals and current achievements, the challenges we face in this area, and our ongoing plans for future progress.

USAID is implementing a \$1.8 billion program for humanitarian assistance, reconstruction and development in Iraq. Our programs cover everything from health and education to economic reform, democratization and of course, infrastructure. As a result, USAID is the primary USG agency involved in the rehabilitation of Iraq's power sector.

Within the infrastructure portfolio – to include the power sector – USAID's activities are implemented through Bechtel Group and Resource Management Services. USAID is also collaborating with the Army Corps of Engineers to monitor the implementation of these contracts. Under the Bechtel contract, \$259 million has been allocated to the power sector, with another \$75 million allocated through Resource Management Services.

Nevertheless, it is important to note that Iraq's power sector is by no means an exclusively USG operation. The Iraqi Commission on Electricity (COE) is in actual fact the lead agency for the country's power sector, and we are encouraging them to fulfill that role. Out of necessity, however, the US is currently providing the vast majority of the Commission's resources. The Coalition Provisional Authority (CPA) is paying the Commission's salaries, while USAID is providing equipment, supplies and skilled manpower. The COE, for its part, is providing an impressive level of engineering expertise, as well as repair parts and supplies left over from their prewar stocks. The COE has 40,000 personnel on staff, and has been repairing its own equipment wherever it can, independently of our assistance. In the longer-term, of course, the COE will be a key player in our transition strategy.

## USAID's Initial Goals for Iraqi Power

USAID's role in the Iraqi power sector did not emerge spontaneously after the war ended, of course. Rather, USAID's intervention in Iraq was the result of extensive pre-war planning – albeit on the basis of fairly limited information. We did not, for example, know much about the age, condition and maintenance status of Iraq's critical infrastructure. Nor could we know for certain how much damage would occur during the conflict itself, despite our very fruitful integration into the US military's prewar target planning. Our greatest unknown was the extent to which Saddam might deliberately destroy critical facilities as part of a "scorched earth" policy as his forces were defeated.

Despite these uncertainties, prior to the war USAID established "immediate," 6-month and 12-month goals for all of our anticipated activities in Iraq. For the power sector, our "immediate" goals were to restore electricity to critical facilities like water and sewage treatment plants, hospitals and clinics, grain mills, seaports and airports, etc. Our 6-month goal was to restore power to at least 40% of the previously-served population, and our 12-month goal was to provide electricity to at least 75% of the previously-served population.

Today – three and a half months into the reconstruction of Iraq – we have achieved many of our initial goals. We are making great progress toward ensuring that critical facilities have reliable access to power – both by prioritizing grid power to these locations and by installing generator backups. In addition, almost every Iraqi who had access to power before the war now has access to power again. What these customers do not have, however, is continuous power. In many cases, the power is still on less frequently or for a shorter time each day as it was before the war.

The key now, therefore, is to generate and transmit more power to customers. From our work in other post-conflict situations, we know that local expectations are always exaggerated. There will always be grumbling about the pace of construction projects, and we will always have to deal with the issue of "too slow".

On April 24<sup>th</sup>, there were 1,275 megawatts of electricity being produced in all of Iraq. This was less than a third of the pre-conflict generation level of 4,400 megawatts. On August 17<sup>th</sup>, Iraq generated 3,307 megawatts – more than a 250% increase since the end of April. Although this is a tremendous improvement, power generation is still clearly our main emphasis for continued progress.

It is also important to highlight two achievements for which the Iraqi Commission on Electricity is primarily responsible. First, while we are working with the Commission to provide a continuous power supply, the COE has taken steps to make the power that is available more predictable for consumers. To that end, the Commission has instituted a "3-hours on, 3-hours off" power-sharing policy in most Iraqi neighborhoods. Secondly, the COE has ended the privileged status previously enjoyed in Tikrit, certain Baghdad neighborhoods, and other centers of Ba'athist power. As a result, electricity is now distributed more equitably throughout the country.

Despite our best efforts, however, the power generation graph that accompanies this paper clearly indicates that progress in the electricity sector has not been uniformly upward. Rather, we have experienced setbacks along the way. At least three specific challenges have contributed to these intermittent setbacks.

### Challenges

The first challenge that deserves to be highlighted is the extent of the disrepair and neglect that Iraq's power sector suffered over twelve years of deferred investment by Saddam's regime. It is no exaggeration to say that this disrepair far exceeded our expectations.

As an example of this underinvestment and the resulting stress on Iraq's power infrastructure, consider that the country's power generation averaged 5,570 megawatts per day in 1992, but only 4,400 megawatts just prior to the conflict this year. Over roughly the same period of time, however, electricity consumption virtually doubled from 18 billion Kwh in 1991 to 34 billion Kwh in 2001. The impact of this poorly-maintained and over-stressed power system has been increased vulnerability to breakdowns, instability in the distribution network, and a lack of available repair parts for an antiquated system. The result, of course, is frequent brownouts and blackouts.

A second challenge we face in restoring Iraq's power generation is the lack of fuel for electricity production. Many electric plants in Iraq are powered by natural gas – a fuel that is normally co-produced along with oil in Iraq. Although Iraqi oil production has now risen to just over a million barrels of oil per day, it takes roughly one and three-quarters to two million barrels per day to yield enough natural gas to pressurize the pipelines that feed Iraq's power plants. Further complicating the issue, the fuel and electricity problem is in many ways a chicken-and-egg situation. Several Iraqi refineries and oil-gas separation plants are currently standing unused because they lack electric power for operation. And of course the fuel they produce is needed to run the power plants.

A third challenge is to ensure that the Iraqi people know that progress is being made. Their expectations of post-war life appear to be based on a myth that Americans can instantly relieve all the problems that existed before the war. We also see hostile Iraqi opinion leaders using the availability of electricity as a weapon against the success of the overall reconstruction process.

The fourth, and most difficult set of challenges we face are essentially symptoms of Iraq's present insecurity. This lack of security manifests itself in the form of organized criminal activity and sabotage – both of which have a significant impact, not so much on power generation, but on transmission.

In the case of theft – primarily of copper conductor – the term “organized criminal activity” is more appropriate than simply “looting”. These are not lone individuals or

small, poorly-resourced gangs who are stealing Iraq's high tension cables. Rather, it takes substantial equipment, like cranes, trucks and significant manpower to remove conductor material and transport it across Iraq's international borders for resale, as is currently occurring.

Although it is hard to quantify the overall impact of this criminal activity, there is ample anecdotal evidence. In May, for example, criminals tore through substations at the Baghdad and Basrah airports, as well as the port of Umm Qasr, breaking open transformers and making off with the copper inside. Also in May, when Bechtel first surveyed the 400 Kv transmission line between Basrah and Al Kut along the Iranian border, about 30 towers were down as a result of war damage. When Bechtel went back a month later, however, criminal activity had increased that number to 100 towers down and the transmission lines had been removed. We even understand that the sale of stolen conductor is beginning to depress the regional copper market.

The other security issue, sabotage, has received widespread media coverage in recent weeks, and justifiably so. As with criminal activity, the total impact is difficult to quantify. The anecdotal evidence, however, is significant. For example, in contrast to general impressions, there is often excess power capacity in southern Iraq. As of July 23, about 240 MW per day were being transferred from Basrah to the central and northern governorates via the high tension line between Basrah and An Nasiriyah. On July 24, however, this line was destroyed by saboteurs, thereby halting power transfers from the South and forcing plants in the Basrah area to reduce their output in accordance with the more limited local power requirements.

In a more recent example, saboteurs knocked out all four 132 Kv circuits leading to the Al Basrah refinery about two weeks ago, effectively shutting down the plant's operation. This, in turn, had a direct impact on fuel availability in Basrah and contributed to the riots that occurred two weekends ago. In this context, however, it is worth noting that the Iraqi Commission on Electricity – not any agency of the USG – is taking the lead in repairing the downed transmission line between Basrah and An Nasiriyah. This line is now projected to be up and running again by September 10<sup>th</sup>.

To address these security issues, CPA has recently established the “power police” – a 1,000-strong force of local Iraqi guards whose job is to protect key infrastructure sites, including power production and transmission systems. The US military is also working to train an Iraqi militia force that will take on similar site protection duties over the longer term.

#### USAID's Contribution to Continued Progress

While CPA and the US military work to address the security issues, USAID and our partners are continuing to implement immediate, and long-term plans to meet Iraq's electricity needs.

Over the short term, we can add 1,100 megawatts to Iraq's daily power generation – thereby restoring the country's prewar output of 4,400 megawatts – by the 1<sup>st</sup> of October. We aim to achieve this goal by implementing four ongoing programs. Our first short-term effort is to make high-impact repairs at underutilized power plants. For example, Bechtel is repairing the gas turbines at the Bayji power plant north of Baghdad that will net approximately 300 megawatts of additional power.

Second, we are purchasing and installing 100 MW worth of new diesel generators at water treatment and pumping stations across Baghdad. These generators will have the dual benefit of ensuring constant water supply and water treatment in Baghdad, while also relieving the national grid of the power they previously drew. Similarly, USAID plans to repair 270 megawatts worth of diesel generators located at grain storage facilities around the country. These generators are connected to the national grid and will not only provide power to the facilities where they are located, but also to the national network. At both the grain storage and water facilities, this distributed generation system will remain in place as a long-term back-up to the national grid.

Finally, new efforts by the Army Corps of Engineers' Task Force RIO to meet the fuel needs of natural gas burning plants will make as much as 700 megawatts of additional power available by mid-November.

By next summer, USAID expects ongoing rehabilitation projects will bring Iraq's power capacity to 6,000 megawatts, thereby fully meeting the current estimated demand for power in Iraq. We look forward to turning a viable power sector completely over to Iraqi control. This is not simply a matter of relinquishing responsibility to the Commission, but also helping the Iraqi authorities establish an appropriate regulatory framework and a sustainable division of labor between the state and private sector.

It is unlikely that the complicated issues involved in this transition can be adequately analyzed and addressed in the short term. Power production – like most industry in Iraq – has long been state-controlled and energy in all forms – fuel oil, gasoline, electricity – has traditionally been heavily subsidized. Under current conditions, fuel would have to be provided virtually without cost to any private power producer who intended to operate profitably in Iraq. There was, for example, limited billing for power before the war, but this was poorly enforced and subject to extensive line theft. In addition, any attempt to bring energy prices in Iraq in line with world market prices will have to be balanced against the concern for social stability and security.

For these larger questions regarding Iraq's future economic system and the orderly transition to a market economy, USAID is assisting CPA with sector-specific advice from contractors like Bechtel and economic specialists from BearingPoint.

## Conclusion

Four key points merit recapitulation. First, the USG has in fact made great strides in rehabilitating Iraq's power sector. Virtually all Iraqis who had access to electricity before the war have access once again. In addition, power generation has increased over 250% in about 3½ months. Second, we have made this progress in spite of significant ongoing challenges due to the effects of under-investment, lack of fuel, and insecurity – the latter being manifested in both criminal activity and sabotage.

Third, notwithstanding these challenges, efforts are underway to bring Iraq's power production back to prewar levels by October, and to meet all anticipated demand before the peak temperatures return next summer. Finally, we are helping the Iraqi authorities create an appropriate regulatory framework and public-private sector division of labor that will establish the basis for a sustainable Iraqi power sector for the long-term.